

## WHAT IS CLAIMED IS:

1           1.     A method for policing one or more flows of a data stream of packets  
2 associated with differing transmission protocols, comprising:  
3                 determining at least one current bandwidth capacity level for the flow;  
4                 ascertaining a packet protocol associated with a packet of the flow;  
5                 identifying a packet parameter in the packet indicative of the  
6 bandwidth consumption of the packet;  
7                 converting the packet parameter to a predetermined format if the  
8 packet is not associated with a predetermined packet protocol; and  
9                 performing a common bandwidth capacity test as a function of the  
10 packet parameter and the current bandwidth capacity level to determine whether the  
11 packet is conforming.

1           2.     The method as in Claim 1, further comprising effecting no conversion  
2 for packets already associated with the predetermined packet format.

1           3.     The method as in Claim 1, further comprising policing a plurality of the  
2 flows of the data stream.

1           4.     The method as in Claim 3, wherein policing a plurality of the flows of  
2 the data stream comprises performing the policing on a flow-by-flow basis.

1           5.     The method as in Claim 1, wherein determining the current bandwidth  
2 capacity level comprises calculating an available bandwidth capacity based on a  
3 committed quality of service rate.

1           6.     The method as in Claim 1, wherein determining the current bandwidth  
2 capacity level comprises calculating an available bandwidth capacity based on a  
3 peak quality of service rate.

1           7.     The method as in Claim 1, wherein determining the current bandwidth  
2 capacity level comprises calculating a credit token level accumulated for a credit  
3 bucket counter.

1           8.     The method as in Claim 7, wherein calculating a credit token level  
2 comprises calculating a committed rate credit token level accumulated for a  
3 committed rate credit bucket counter.

1           9.     The method as in Claim 7, wherein calculating a credit token level  
2 comprises calculating a peak rate credit token level accumulated for a peak rate  
3 credit bucket counter.

1           10.    The method as in Claim 1, wherein determining the current bandwidth  
2 capacity level comprises determining a plurality of current bandwidth capacity levels  
3 for the flow.

1           11.    The method as in Claim 10, wherein plurality comprises at least a  
2 committed capacity level and a peak capacity level.

1           12.    The method as in Claim 1, wherein ascertaining the packet protocol  
2 comprises analyzing a packet header for header information identifying the packet  
3 protocol.

1           13.    The method as in Claim 12, wherein analyzing the packet comprises  
2 parsing the packet header and searching for at least one header field identifying the  
3 packet as a FAST packet.

1           14.    The method as in Claim 1, wherein identifying a packet parameter  
2 comprises identifying the number of data units in the packet.

1           15.    The method as in Claim 14, wherein converting the packet parameter  
2   to a predetermined format comprises converting the number of data units to a  
3   number of bytes.

1           16.    The method as in Claim 15, wherein converting the number of data  
2   units to a number of bytes comprises calculating a product of the number of data  
3   units and a number of bytes per data unit.

1           17.    The method as in Claim 16, wherein calculating the product comprises  
2   calculating the product of the number of ATM cells and the number of bytes of  
3   payload in an ATM cell.

1           18.    The method as in Claim 1, wherein converting comprises converting a  
2   number of first data units of the packet parameter to a number of second data units  
3   corresponding to the predetermined packet protocol.

1           19.    The method as in Claim 1, wherein performing a common bandwidth  
2   capacity test comprises comparing a packet bandwidth consumption value  
3   proportional to the packet parameter with the current bandwidth capacity level.

1           20.    The method as in Claim 1, wherein performing a common bandwidth  
2   capacity test comprises comparing a packet bandwidth consumption value  
3   proportional to the converted packet parameter with the current bandwidth capacity  
4   level.

1           21.    The method as in Claim 1, wherein the common bandwidth capacity  
2   test is a single shared test imposed on all packets, regardless of the original protocol  
3   of the packet.

1           22.    The method as in Claim 1, wherein performing a common bandwidth  
2   capacity test further comprises marking the packets in accordance with color-based  
3   marking.

1           23.    A packet policing system for providing multi-protocol policing of  
2 packets of a data stream, comprising:  
3                   a classifier to receive and parse the data stream into a plurality of  
4 multi-protocol traffic flows; and  
5                   a policing processor coupled to the classifier to receive each of the  
6 traffic flows and configured to convert each of the packets into a predetermined  
7 format, wherein the policing processor is further configured to perform a shared  
8 bandwidth capacity test to determine packet conformance for each of the packets,  
9 regardless with their original protocol affiliation.

1           24.    The packet policing system as in Claim 23, further comprising a  
2 memory to store a current bandwidth capacity level for each of the multi-protocol  
3 traffic flows, wherein the shared bandwidth capacity test is a function of the current  
4 bandwidth capacity level.

1           25.    The packet policing system as in Claim 23, further comprising an  
2 editing module coupled to the policing processor to modify each of the packets with  
3 the packet conformance provided by the policing processor.

1           26.    The packet policing system as in Claim 25, further comprising a packet  
2 drop module coupled to receive the modified packets from the editing module, and  
3 to accept or discard each of the modified packets based on the packet  
4 conformance.

1           27.    A packet policing system for policing one or more flows of a data  
2 stream of packets associated with differing transmission protocols, comprising:  
3                   means for determining at least one current bandwidth capacity level for  
4 the flow;  
5                   means for ascertaining a packet protocol associated with a packet of  
6 the flow;  
7                   means for identifying a packet parameter in the packet indicative of the  
8 bandwidth consumption of the packet;

9 means for converting the packet parameter to a predetermined format  
10 if the packet is not associated with a predetermined packet protocol; and  
11 means for performing a common bandwidth capacity test as a function  
12 of the packet parameter and the current bandwidth capacity level to determine  
13 whether the packet is conforming.

1 28. A method for policing bandwidth conformance of one or more flows of  
2 a data stream including packets associated with a plurality of transmission protocols,  
3 the method comprising:  
4 determining at least one current bandwidth capacity level for the flow;  
5 ascertaining a packet protocol associated with each packet of the flow;  
6 identifying a packet parameter in each of the packets indicative of the  
7 bandwidth consumption of the respective packet;  
8 converting the packet parameter to a predetermined format for the  
9 packets that do not originally correspond to a predetermined packet protocol;  
10 preserving the packet parameter for the packets corresponding to the  
11 predetermined packet protocol; and  
12 subjecting the packets of each packet protocol to a single bandwidth  
13 capacity test, wherein the capacity test determines whether the packet is conforming  
14 as a function of the packet parameter and the current bandwidth capacity level,  
15 regardless of the packet's original packet protocol association.

1 29. The method as in Claim 28, further comprising performing the policing  
2 on a flow-by-flow basis.

1 30. The method as in Claim 28, wherein preserving the packet parameter  
2 comprises for the packets corresponding to the predetermined packet protocol  
3 comprises utilizing the packet parameter without conversion.

1 31. The method as in Claim 28, wherein identifying a packet parameter  
2 comprises identifying a number of data units in the packet.

1           32.    The method as in Claim 31, wherein converting the packet parameter  
2 comprises converting the number of data units to a number of bytes.

1           33.    The method as in Claim 32, wherein converting the number of data  
2 units to a number of bytes comprises calculating a product of the number of data  
3 units times a number of bytes per data unit.

1           34.    The method as in Claim 33, wherein calculating a product comprises  
2 calculating the product of the number of ATM cells in the packet and the number of  
3 bytes of payload in an ATM cell.

1           35.    The method as in Claim 28, wherein converting the packet parameter  
2 comprises converting a number of first data units of the packet parameter to a  
3 number of second data units corresponding to the predetermined packet protocol.

1           36.    The method as in Claim 28, wherein subjecting the packets of each  
2 packet protocol to a single bandwidth capacity test comprises comparing a packet  
3 bandwidth consumption value proportional to the packet parameter with the current  
4 bandwidth capacity level.

1           37.    The method as in Claim 28, wherein subjecting the packets of each  
2 packet protocol to a single bandwidth capacity test comprises comparing a packet  
3 bandwidth consumption value proportional to the converted packet parameter with  
4 the current bandwidth capacity level.

1           38.    The method as in Claim 28, further comprising marking the packets in  
2 accordance with color-based marking.

1           39.    A computer-readable medium having computer-executable instructions  
2 for policing one or more flows of a data stream of packets associated with differing  
3 transmission protocols, the computer-executable instructions performing steps  
4 comprising:

- 5 determining at least one current bandwidth capacity level for the flow;
- 6 ascertaining a packet protocol associated with a packet of the flow;
- 7 identifying a packet parameter in the packet indicative of the
- 8 bandwidth consumption of the packet;
- 9 converting the packet parameter to a predetermined format if the
- 10 packet is not associated with a predetermined packet protocol; and
- 11 performing a common bandwidth capacity test as a function of the
- 12 packet parameter and the current bandwidth capacity level to determine whether the
- 13 packet is conforming.

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